

### REMARKS

Claims 1-19 are pending in this application. The Examiner rejected claims 1-19 and objected to the Specification, which the Applicant is amending by this Response. The Applicant respectfully requests reconsideration and allowance of claims 1-19.

### Oath/Declaration

The declaration of the first inventor, Baskaran Vijayakumar, was filed with the U.S. Patent & Trademark Office on April 10, 2002. The declaration of the second inventor, Konstantine Iourcha, could not be secured. In lieu of the second inventor's declaration, the Applicant had filed a Petition under 37 C.F.R. § 1.47(a). This Petition was granted on August 5, 2002 by Alesia M. Brown, Petitions Attorney, Petitions Office (see paper no. 6). The Applicant kindly requests that the Examiner contact the undersigned if the Examiner believes that this matter is not yet resolved.

### Objections

The Examiner objected to the Specification on the grounds that an application number for a commonly-assigned application described under the "Cross-References to Related Applications" is omitted. The Applicant directs the Examiner's attention to number "09/855,280," which is the application number of the commonly-assigned application. The Applicant believes this objection to the Specification is now moot.

The Examiner also objected to the Specification because paragraph [0037] included the following sentence fragment: "Finally." The Applicant is

amending the specification to delete this fragment. Further, the Examiner objected to the Specification because the Abstract included the following language: “coarse sampling.. Subsequently.” The Applicant is amending the Abstract to delete the second period. The Applicant believes that upon entry of these amendments, the corresponding objections are now overcome. Therefore, the Applicant requests that these objections be withdrawn.

### Rejections Under 35 U.S.C. § 103

#### I. Perry in view of Dickie

The Examiner rejected claims 1, 4-7, 9, 12 and 19 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Number 6,292,193 to Perry et al. (hereinafter “Perry”) in view of U.S. Patent Number 6,016,152 to Dickie. The Applicant respectfully traverses for at least the following reasons.

#### Claims 1-8

As the Examiner has stated at Office Action, p. 3, lines 7-10, Perry fails to teach the claimed elements of either “morphing a texture reconstruction filter characteristic” based upon input information, or “an effective filter characteristic matches the texture reconstruction filter characteristic of a texture reconstruction filter used for coarse sampling.” But the Examiner indicates that both claimed elements are taught by Dickie. See e.g., Dickie, col. 4, line 65 to col. 5, line 5 (“A desired reconstruction filter 245, e.g., a bilinear or bicubic filter, also concentric with the unit circle 240 is modified

according to this linear transformation.”). The Applicant respectfully disagrees with this assertion and traverses the rejection.

The Perry and Dickie references, either alone or in combination, do not teach or disclose all of the limitations of claim 1. For example, Dickie appears to teach that a reconstruction filter of a specific type is first selected, where such reconstruction filter includes a bilinear filter, a bicubic filter, and a box filter. See Dickie, col. 5, lines 26-32. Further, Dickie discloses that the selected reconstruction filter is modified in accordance with a linear transformation to form a modified reconstruction filter. See e.g., Dickie, col. 2, lines 41-48. Dickie teaches, however, that the modified reconstruction filter (and its characteristics) is based on the linear transformation, and not on input information relating to polygon and texture data. Therefore, Dickie fails to teach or suggest the claimed element of “morphing a texture reconstruction filter characteristic based upon the input information,” as recited in claim 1.

Because Dickie, whether taken alone or combined with Perry, fails to teach or suggest the claimed combination set forth in claim 1, independent claim 1 is not obvious and thus allowable. Further, claims 4-8 depend from allowable claim 1, and thus are patentable for at least the same reasons. The Applicant kindly requests that the associated 103 (a) rejections be withdrawn.

#### Claims 9 and 12

As discussed in relation to claim 1, the Perry and Dickie references, either alone or in combination, do not teach or disclose all of the limitations of claim 9. For example, Dickie fails to teach or suggest the claimed element of

“morphing a texture reconstruction filter characteristic based upon the input information,” as set forth in claim 9. Because Dickie, whether taken alone or combined with Perry, fails to teach or suggest the combination recited in claim 9, this independent claim is not obvious and thus is allowable. Further, claim 12 depends from allowable claim 9, and thus is allowable for at least the same reasons. The Applicant kindly requests that the associated 103 (a) rejections be withdrawn.

#### Claim 19

As discussed above in regard to claim 1, the Perry and Dickie references, either alone or in combination, do not teach or disclose all of the limitations of claim 19. For example, Dickie fails to teach or suggest the claimed element of “morphing a texture reconstruction filter characteristic based upon the input information,” as recited in claim 19. Because Dickie, whether taken alone or combined with Perry, fails to teach or suggest the combination set forth in claim 19, this independent claim is not obvious and thus is allowable. The Applicant requests the withdrawal of the associated 103 (a) rejections.

#### II. Perry in view of Dickie and in further view of Waters

The Examiner rejected claims 2, 3, 10 and 11 under 35 U.S.C. § 103(a) as being unpatentable over Perry in view of Dickie and in further view of U.S. Patent Number 6,359,619 to Waters et al. (hereinafter “Waters”). The Applicant respectfully traverses for at least the following reasons.

#### Claims 2 and 10

As the Examiner has stated at Office Action, p. 5, lines 8-10 that both Perry and Dickie fail to teach “the input information relates to a rate of sampling of the polygon data.” But the Examiner indicates that Waters does disclose this claimed element at col. 9, lines 34-46 and 59-63, (e.g., “Because shader maps are stored at multiple resolutions, varying sampling rates can easily be accommodated.”). The Applicant respectfully disagrees with this assertion and traverses the rejection.

The Perry, Dickie and Waters references, either alone or in combination, do not teach or disclose all of the limitations of claims 2 and 10. For example, Waters appears to disclose varying sampling rates to implement different shader maps at varying resolutions. See Id. But nowhere does Waters or any other cited reference teach or suggest that “a rate of sampling of the polygon data” relates to “input information” as a basis for morphing a texture reconstruction filter characteristic. Since none of the cited references teach or suggest at least this claimed element, the combination of elements set forth in claims 2 and 10 is not obvious. Therefore, claims 2 and 10 are patentable. Further, claims 2 and 10 depend from patentable claims 1 and 9, respectively, and thus are allowable for at least the same reasons.

#### Claims 3 and 11

As the Examiner has stated at Office Action, p. 5, lines 18-20 that both Perry and Dickie fail to teach “the input information relates to a degree of warping per texture coordinate.” But the Examiner indicates that Waters does disclose this claimed element at col. 5, lines 3-8, (E.g., “TSD<sub>d</sub> then applies a

fixed-point perspective warp to the intermediate representation for a particular instance and frame.”). The Applicant respectfully disagrees with this assertion and traverses the rejection.

The Perry, Dickie and Waters references, either alone or in combination, do not teach or disclose all of the limitations of claims 3 and 11. For example, Waters appears to disclose applying a perspective warp operation to deform or transform an image using a fixed-point intermediate representation. See Id. Nowhere, however, does Waters or any other cited reference teach or suggest that “a degree of warping per texture coordinate” relates to “input information” as a basis for morphing a texture reconstruction filter characteristic. Since none of the cited references teach or suggest at least this claimed element, the combination of elements set forth in claims 3 and 11 is not obvious. Therefore, claims 3 and 11 are patentable. Further, claims 3 and 11 depend from patentable claims 1 and 9, respectively, and thus are allowable for at least the same reasons.

### III. Perry in view of Dickie and in further view of Waters and Beier-Neely

The Examiner rejected claim 8 under 35 U.S.C. § 103(a) as being unpatentable over Perry in view of Dickie and in further view of Waters and in further view of “Programming Assignment #5: Beier-Neely Morphing” (hereinafter “Beier-Neely”). The Applicant kindly respectfully traverses for at least the following reasons.

#### Claim 8

Although the Examiner states that Dickie does not teach a value  $\beta = \min(\delta * (n-1)/n, 1.0)$ , the Examiner indicates that Beier-Neely purportedly does teach this value as set forth in claim 8. The Applicant disagrees with this characterization.

In accordance with Beier-Neely, "N" represents a desired number of intermediate images. Claim 8, however, sets forth that "n" represents a sampling rate, which cannot be equated with Beier-Neely's desired number of intermediate images, N. Thus, the Perry, Dickie, Waters and Beier-Neely references, alone or in combination with any other reference, fail to teach or suggest the combination set forth in claim 8. Therefore, claim 8 is not obvious and thus is allowable. Further, claim 8 depends from allowable claim 1 and is allowable for at least the same reasons. The Applicant kindly requests the withdrawal of the corresponding 103 (a) rejection.

#### IV. Waters in view of Cosman

The Examiner rejected claims 13 and 15 under 35 U.S.C. § 103(a) as being unpatentable over Waters and in view of U.S. Patent No. 5,734,386 to Cosmon et al. (hereinafter "Cosmon"). The Applicant respectfully traverses for at least the following reasons.

##### Claims 13 and 15

The Examiner states that Waters teaches "a second module coupled to the first module adapted to select a filtering mode based upon a sampling rate

$n$  of polygon data and a degree of warping  $\delta$  per texture coordinate,” as set forth in claim 13. The Applicant disagrees with this characterization.

Although Waters suggests that sampling rate can be varied for multiple resolutions of shader maps, see Waters, col. 9, lines 61-64, nowhere does Waters teach or suggest “a second module . . . adapted to select a filtering mode based upon a sampling rate  $n$  of polygon data and a degree of warping  $\delta$  per texture coordinate.” Hence, Waters does not teach or suggest, whether alone or in combination of any other cited reference, the combination set forth in claim 13. Therefore, independent claim 13 is not obvious and thus is patentable. Further, claim 15 depends from allowable claim 13, and thus is allowable for at least the same reasons. The Applicant kindly requests the withdrawal of the corresponding 103 (a) rejections.

#### V. Waters in view of Cosman and Dickie

The Examiner rejected claims 16 and 17 under 35 U.S.C. § 103(a) as being unpatentable over Waters and in view of Cosmon in view of Dickie. The Applicant respectfully traverses for at least the following reasons.

##### Claims 16 and 17

The Examiner states that Waters teaches “a filter select module adapted to select a filtering mode based upon a sampling rate  $n$  of polygon data,” as set forth in claim 16. The Applicant disagrees with this characterization.

Although Waters suggests that sampling rate can be varied for multiple resolutions of shader maps, see Waters, col. 9, lines 61-64, nowhere does



Waters teach or suggest “a filter select module . . . adapted to select a filtering mode based upon a sampling rate  $n$  of polygon data.” Hence, Waters does not teach or suggest, whether alone or in combination of any other cited reference, the combination set forth in claim 16. Therefore, independent claim 16 is not obvious and thus is patentable. Further, claim 17 depends from allowable claim 16, and thus is allowable for at least the same reasons. The Applicant kindly requests the withdrawal of the corresponding 103 (a) rejections.

VI. Waters in view of Cosman, Dickie and Beier-Neely

The Examiner rejected claims 14 and 18 under 35 U.S.C. § 103(a) as being unpatentable over Waters and in view of Cosmon in further view of Dickie and in further view of Beier-Neely. The Applicant respectfully traverses for at least the following reasons.

Claims 14 and 18

As stated in regard to claim 8, the Examiner states that Beier-Neely purportedly teaches a value  $\beta = \min(\delta * (n-1)/n, 1.0)$ , as set forth in claims 14 and 18. The Applicant disagrees with this assertion for at least the same reasons indicated above in connection with claim 8.

Specifically, the Beier-Neely, Waters, Cosman, and Dickie references, alone or in combination of any other cited reference, do not teach or suggest the combinations set forth in claims 14 and 18. Therefore, dependent claims 14 and 18 are not obvious and thus are patentable. Further, claims 14 and 18 depend from allowable claims 13 and 16, respectively, and thus are allowable

for at least the same reasons. The Applicant kindly requests the withdrawal of the corresponding 103 (a) rejections.

### CONCLUSION

Applicants respectfully submit that all pending claims present patentable subject matter over the art of regard, and therefore, requests that the Examiner withdraw the rejections.

Attached hereto is an appendix entitled "VERSION WITH MARKINGS SHOWING CHANGES MADE," which is a marked-up version of the changes being made to this application by this Response.

The Applicants respectfully request that the Examiner enter this Response, (re)consider the pending claims and issue a Notice of Allowance. If the Examiner believes a telephone conference would expedite prosecution of this application, the Applicants request that the Examiner telephone the undersigned at the number below.

Respectfully submitted,

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Date: 3/24/03

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VERSION WITH MARKINGS SHOWING CHANGES MADE

IN THE SPECIFICATION

At paragraph [0001], please replace that paragraph with the following:

This application claims the benefit of Provisional Patent Application Serial No. 60/204,085, filed on May 12, 2000, entitled "A Matched Texture Filter Design for Rendering Multi-Rate Data Samples," and is related to a commonly-assigned U.S. Patent Application Serial No. [ ] **09/855,280** filed on May 14, 2001, entitled "Selective Super-Sampling/Adaptive Anti-Aliasing or Complex 3D Data", the subject matter of which is herein incorporated by reference.

At paragraph [0037], please replace that paragraph with the following:

When  $\alpha_u = 0$ , the value of  $(1 - \alpha_u)$  is represented by segment 210 with respect to the  $u$  texture coordinate direction. When  $\alpha_u = 1$ , the value of  $(1 - \alpha_u)$  is represented by segment 212 with respect to the  $u$  texture coordinate direction. **[Finally. ]**When  $\alpha_u = (uFraction - \beta/2)/(1 - \beta)$ , the value of  $(1 - \alpha_u)$

is represented by segment 214 with respect to the  $u$  texture coordinate direction.

At the Abstract, please replace that paragraph with the following:

A method and apparatus for texture filtering is provide wherein a filter select module is adapted to select a filtering mode based upon a sampling rate of polygon and texture data. The filter mode is selected by determining the filter characteristics of the selected filtering mode based upon the sampling rate and a degree of warping per texture coordinate. A texture reconstruction filter characteristic is morphed based upon the input polygon and texture data so that, after subsamples are aggregated, an effective filter characteristic matches the texture reconstruction filter characteristic of a texture reconstruction filter used for coarse **[sampling..] sampling**. Subsequently, a texel blending module computes texel blending factors based on the filtering mode determined by the filter select module.